



Performance of Concrete Pavement in Virginia

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Outline of the Presentation

- **Overview of Concrete Pavement in Virginia**
- **Statewide Concrete Pavement Performance**
- **Recently Built Concrete Pavement Performance**
- **Conclusions**

Overview of Concrete Pavement in Virginia

•Types of concrete pavement

- Jointed Reinforced Concrete (JRC)
- Jointed Plain Concrete (JCP)
- Continuously Reinforced Concrete (CRC)

•VDOT history of concrete pavement

- First concrete pavement in 1913
- First bonded concrete overlay in 1990 on route 13 in Eastern shore
- First unbonded in 2012 on route 58 in HR

•Exposed lane miles of concrete pavement

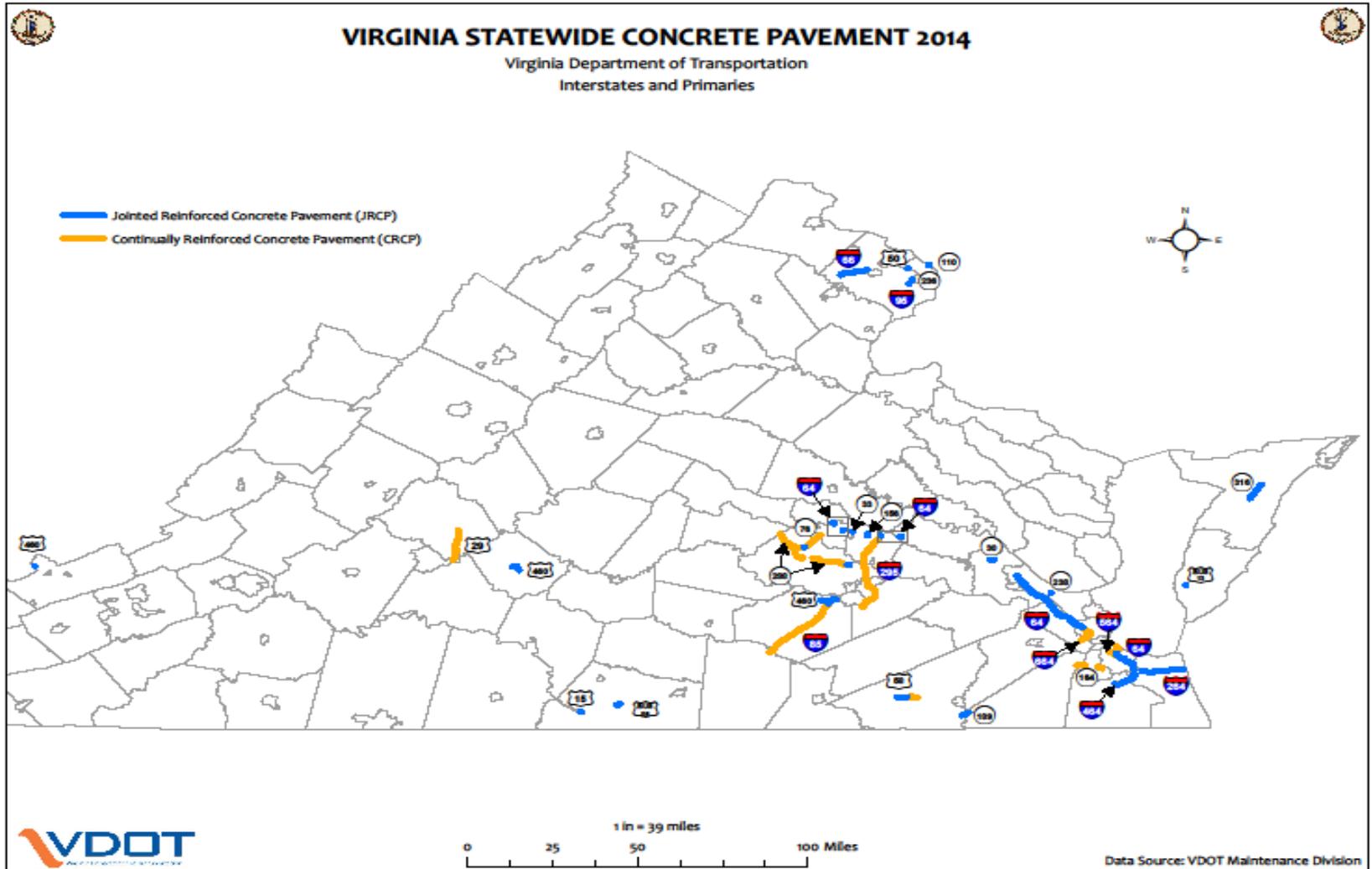
- CRC: 451 miles
- Jointed: 433 miles* (JRC & JCP)

•Concrete pavement under asphalt overlay: over 2,700 lane miles

What is the age for oldest exposed PCC in VA?

- a. 40-50 b. 50-60 c. 60-70 **d. 70-80** e. 80-90

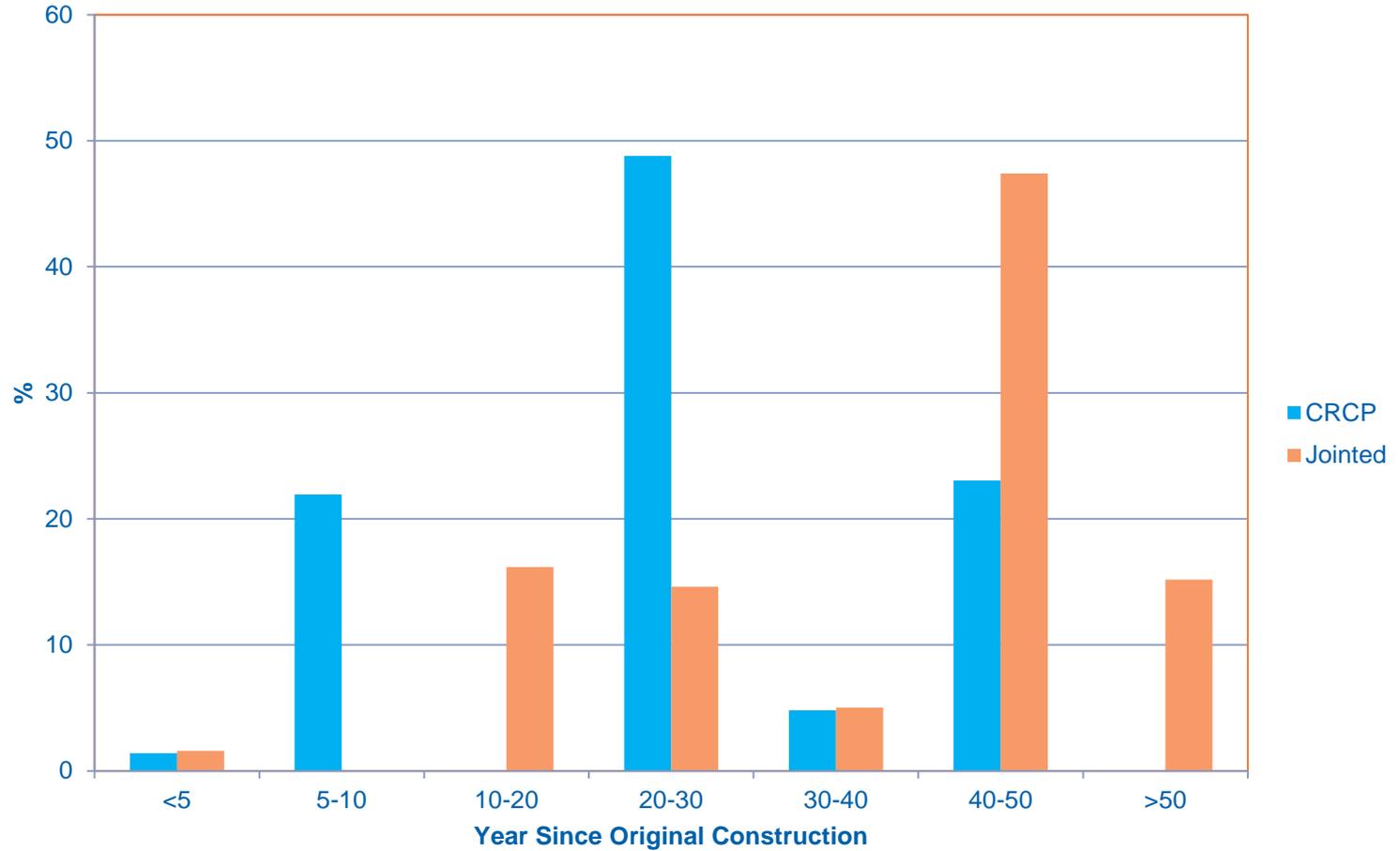
Statewide Exposed Concrete Pavement



Concrete Pavement Lane Miles By District and System

District	CRCP			Jointed Concrete		
	Primary	IS	Total	Primary	IS	Total
Bristol						
Salem				1		1
Lynchburg	43		43	11		11
Richmond	117	215	332	70	7	77
HR	15	61	76	33	270	303
FB						
Culpeper						
Staunton						
Nova				4	37	41
Statewide	175	276	451	119	314	433

Distribution of PCC Pavement by Age



Some Key Points

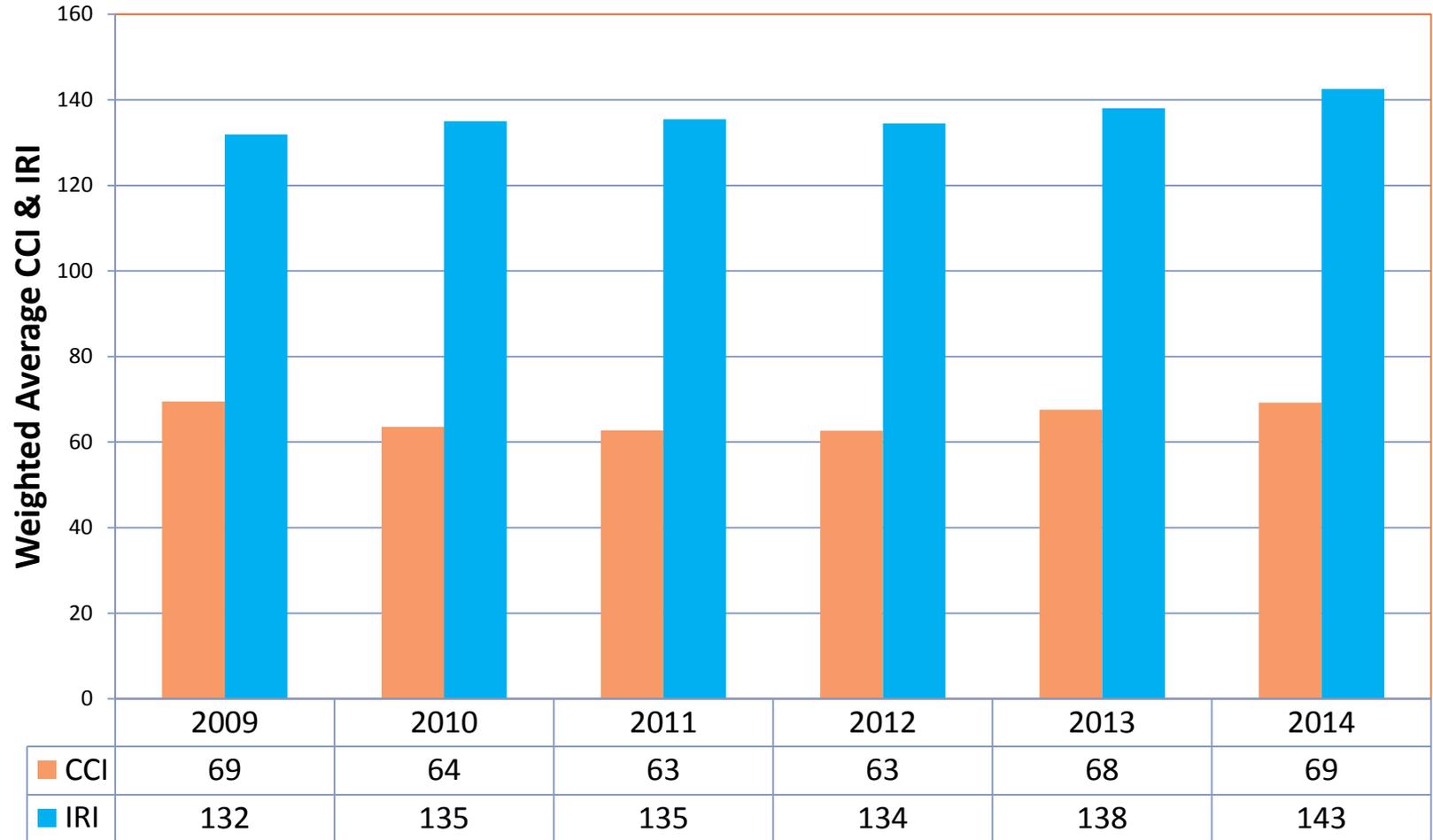
- **Pavement Management System (PMS) data has been used**
 - **Rating**
 - **History**
- **Rating is for right lane only**
- **PMS does not capture the patching history consistently**
- **Some data might not have been updated**
- **Objective is to provide the summary of performance from PMS**
- **Analysis of rating and maintenance history is needed to assess true performance and better interpretation of the data**

Performance measures in VA

- **Performance measured by Critical Condition Index (CCI)**
 - Range 0 to 100, the higher the better
- **Jointed pavement**
 - CCI = Slab Distress Rating (SDR)
- **CRC pavement**
 - CCI= Lower of Conc. Punchout Rating (CPR) & Conc. Distress Rating (CDR)
- **Maintenance Division's annual distress survey provides the CCI**
 - Excellent (>90); Good (70-89); Fair (60-69); Poor (50-59), V. Poor (<50)*
- **Smoothness index: International Roughness Index (IRI)**
 - Excellent (<60); Good (60-99); Fair (100-139); Poor (140-199), V. Poor (>199)*

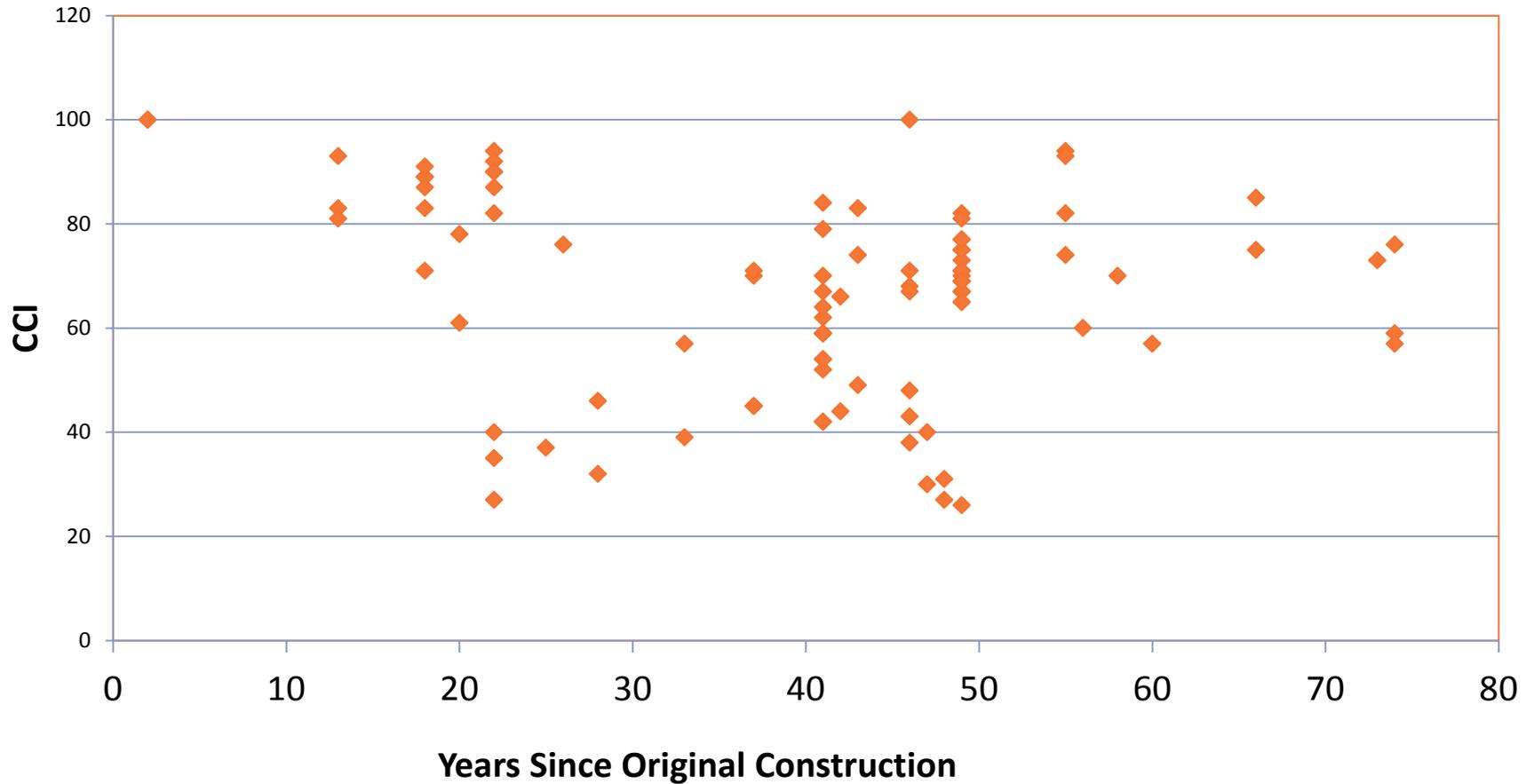
**State of the condition report 2014*

Statewide Jointed Concrete Performance

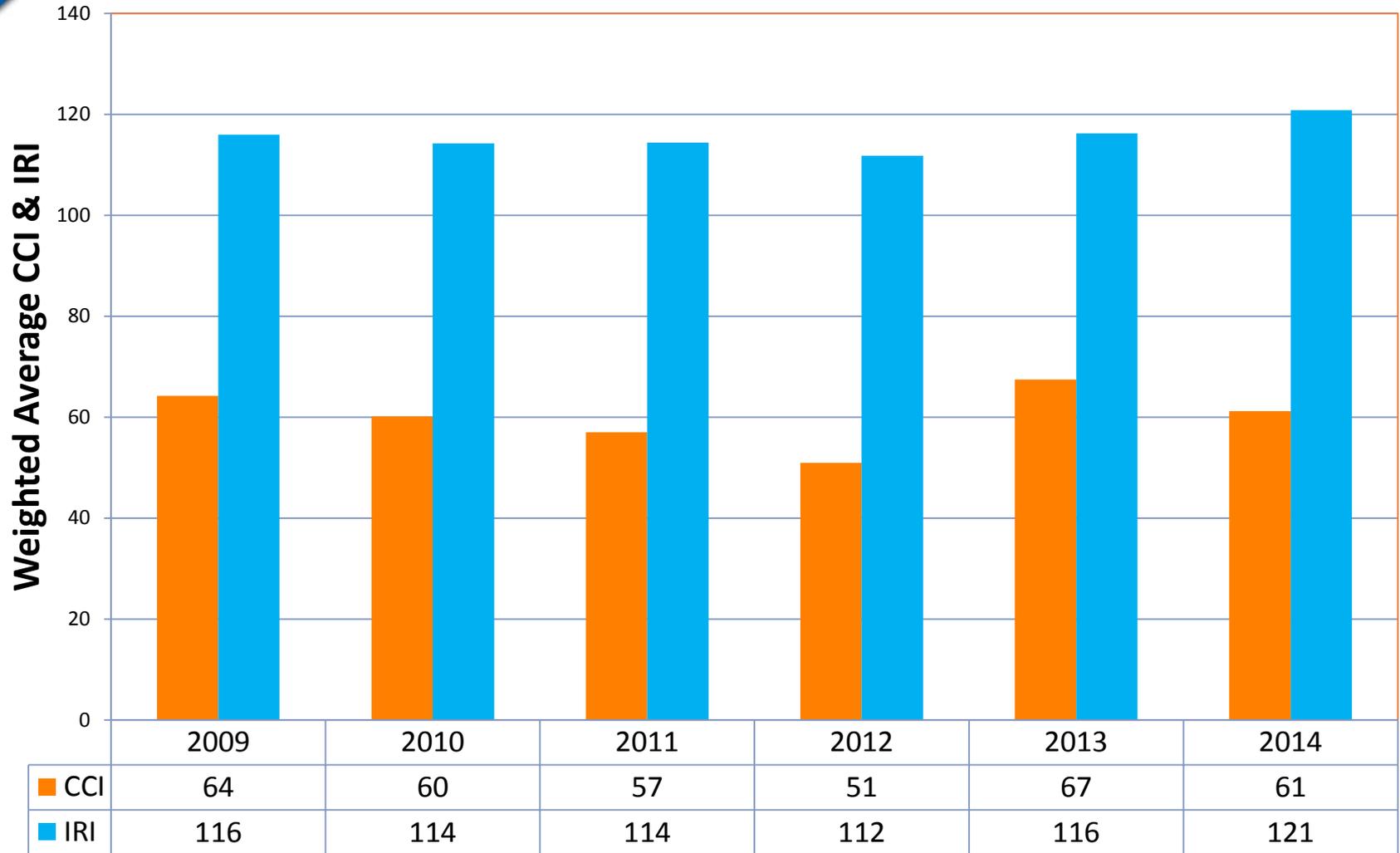


CCI category: Excellent (>90); Good (70-89); Fair (60-69); Poor (50-59), V. Poor (<49)
 IRI category Excellent (<60); Good (60-99); Fair (100-139); Poor (140-199), V. Poor (>200)

Jointed Concrete Performance: 2014 CCI Rating

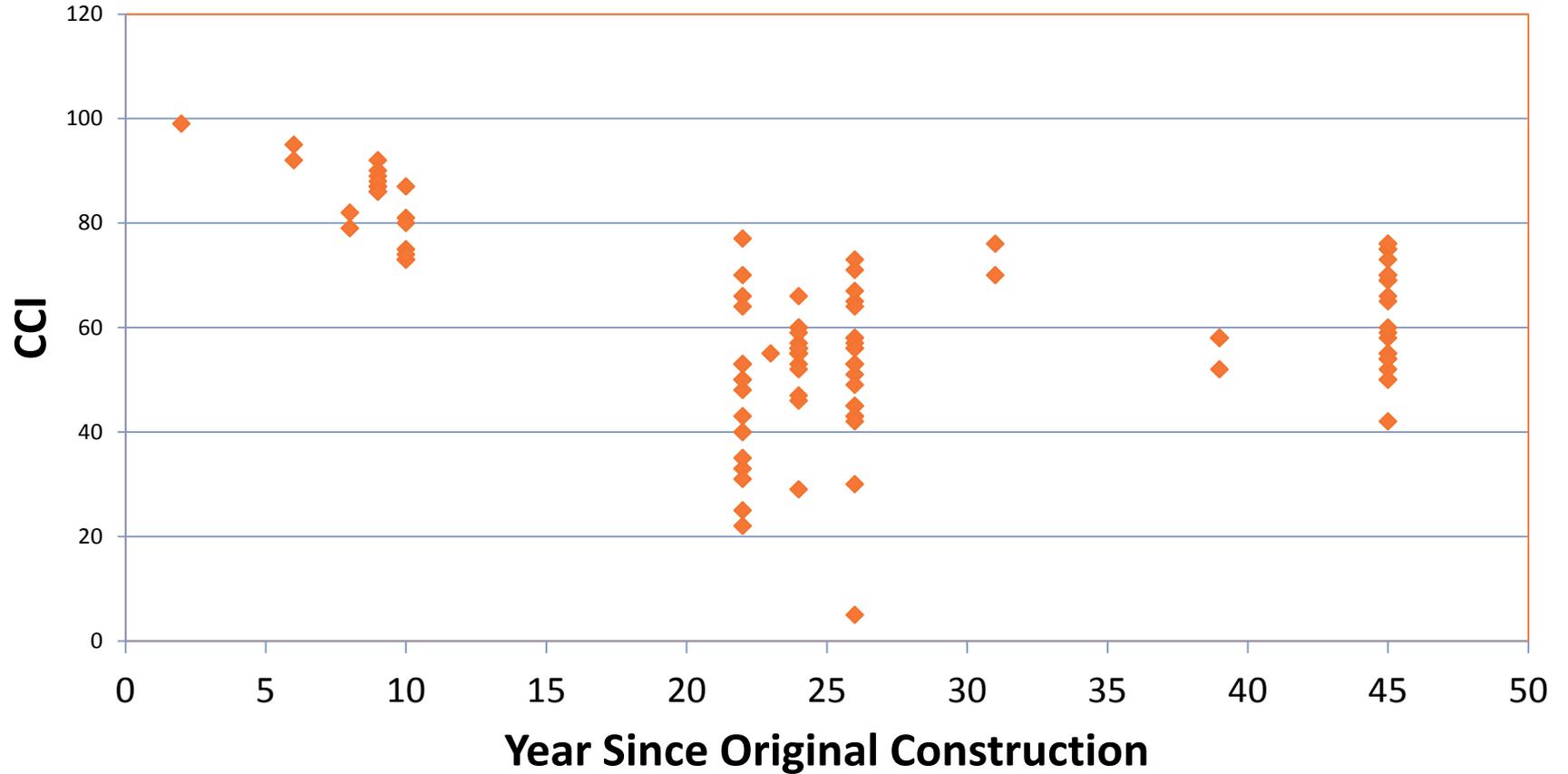


Statewide CRCP Performance



CCI category: Excellent (>90); Good (70-89); Fair (60-69); Poor (50-59), V. Poor (<49)
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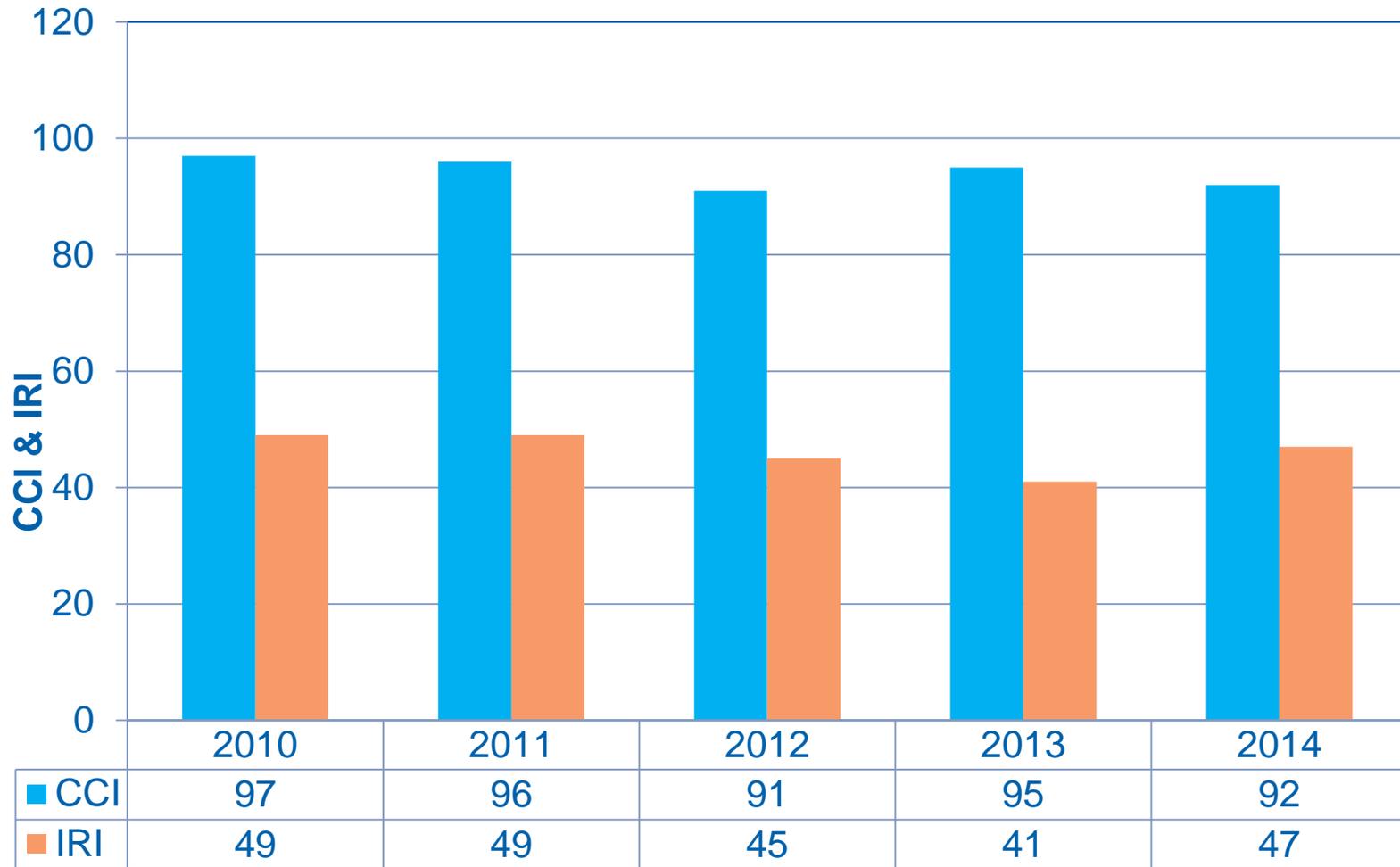
CRCP Performance: 2014 CCI Rating



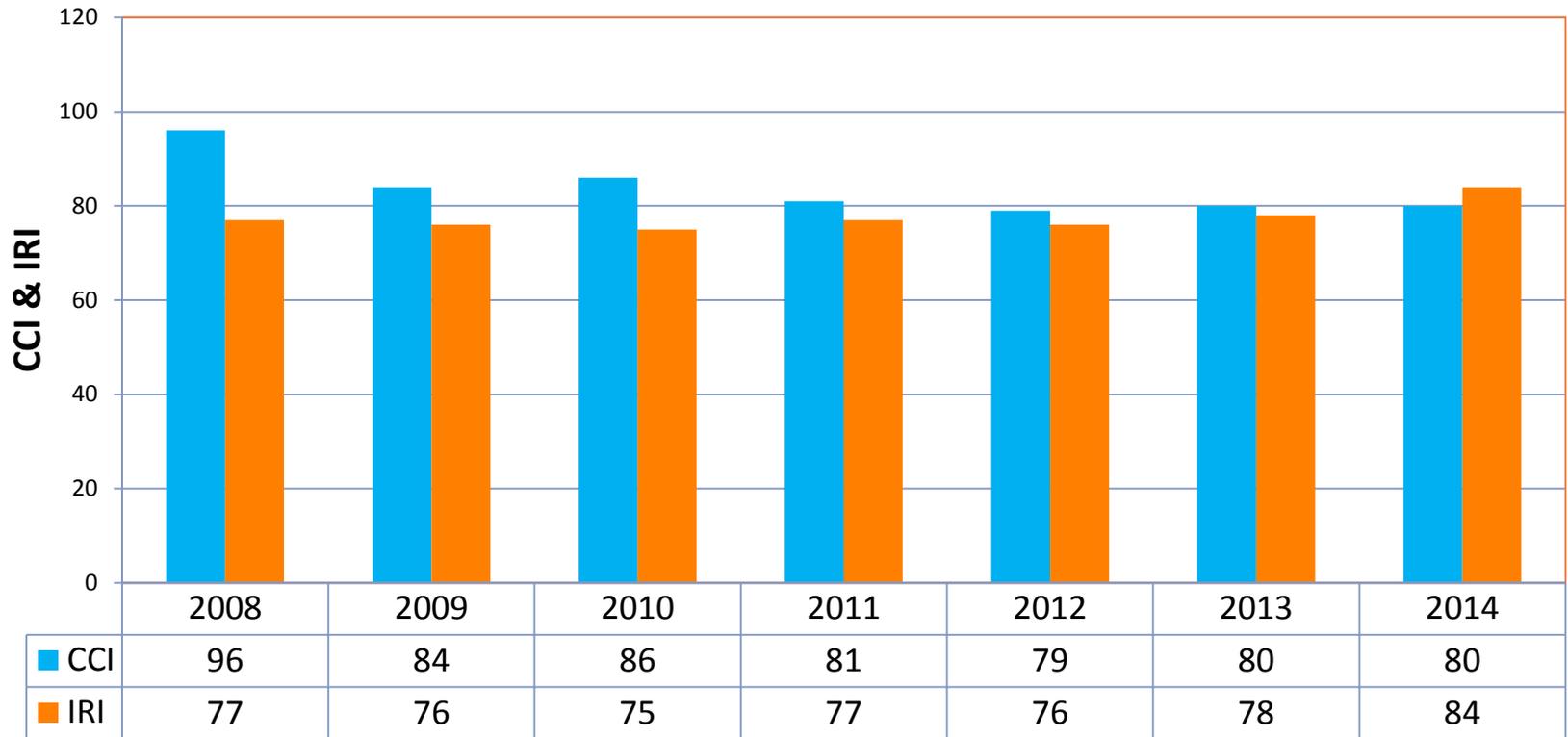
Recently Built Concrete Pavements in VA

Route	Location	Year Built	Pavement Type	Thickness	% Steel	Drainage layer	Base Layer
IS-64 (Battlefield Blvd)	Hampton Roads	2008	CRCP	13	0.7% & # 7 bar	OGDL-3"	6 "- Cement Treated Recycled Concrete
SR-288	Richmond	2000-2001	CRCP	10	0.7% & # 6 bar	OGDL-3"	6-8" CTA
US 29 (Madison Hgt. Bypass)	Lynchburg	2004-2005	CRCP	12	0.7% & # 6 bar	BM 25.0	8" Cement Treated Soil

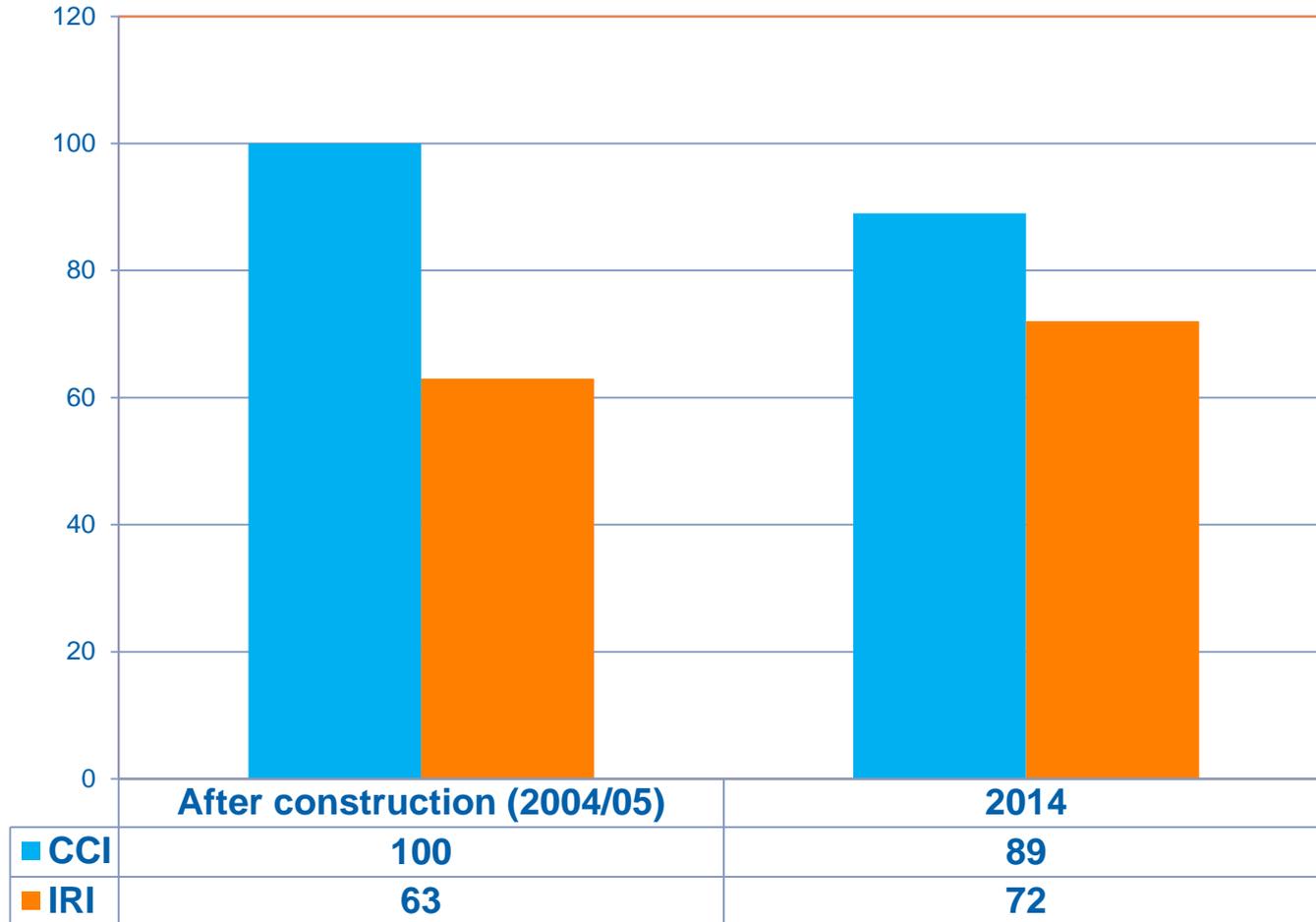
I64 WB Battlefield Blvd. Built in 2008



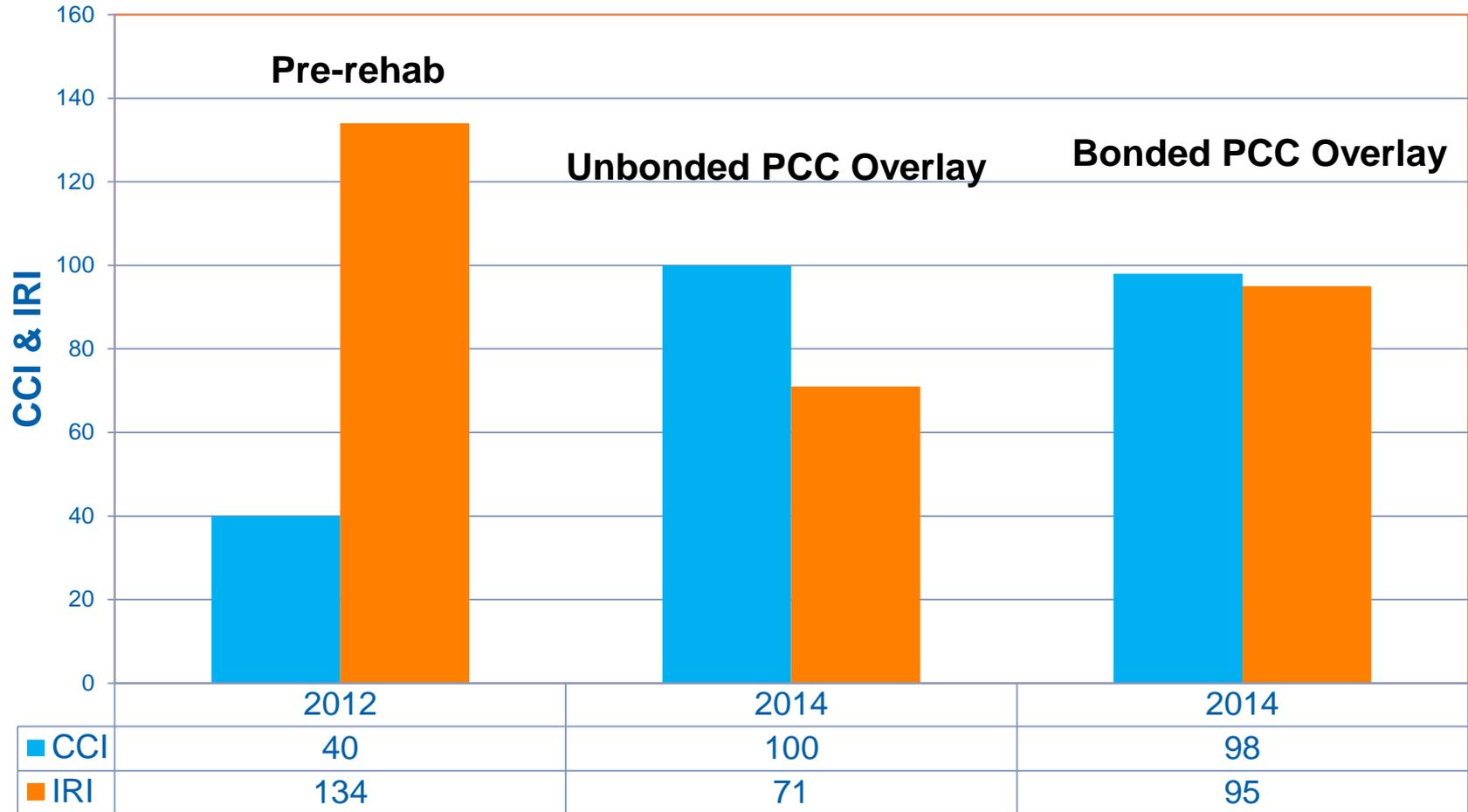
SR 288 NB in Richmond (Rte 76 to Charter Colony Parkway) Built in 2000-2001



US 29 Rating (NB) Built in 2004/2005



Unbonded & Bonded Concrete Overlay Rte 58 in Southampton County, HR Built in 2012



Concrete Pavement in Virginia in a Slide



Rte 13, 1913



Rte 316, 2015
74 years Old



Madison Hgt. Bypass, 2004

Conclusions

- **Majority of the exposed concrete pavements are 20+ years old & exceeded design life**
- **Concrete pavements built within last 15 years seem to perform well**
- **Maintenance needs to be captured in the PMS**
- **Is there a cost effective way to improve IRI on structurally good pavement?**
- **In depth analysis needed to have a more objective performance analysis**

Thank you

Questions?